

ABSTRACT OF THE DISCLOSURE

A system and method for managing access to a satellite-based transponder by a plurality of aircraft each having a mobile radio frequency (RF) system. The system employs a ground-based network operations center ("NOC") having a central control system for managing access to the satellite-based transponder so that the aggregate power spectral density (PSD) of the RF signals of all the mobile systems does not exceed, at any time, limits established by regulatory agencies to prevent interference between satellite systems. This is accomplished by accurately estimating the PSD of each mobile terminal at the NOC using a reverse calculation method to determine mobile terminal EIRP and then using antenna models to project the EIRP on to the GEO arc. Accurate knowledge of the mobile terminal location and attitude is acquired through periodic reports sent from the mobile terminal to the NOC. The invention employs a dual loop return link power control system whereby the receive E_b/N_0 from the aircraft is measured at the ground station and power control commands are sent back to the aircraft to maintain the receive E_b/N_0 within a tight control range above the threshold E_b/N_0 value. The second control loop on the mobile terminal maintains the EIRP at the commanded levels during rapid changes in attitude.